

STATE OF COLORADO  
DIVISION OF WILDLIFE  
DEPARTMENT OF NATURAL RESOURCES

DATE: August 13, 1974

TO: C. E. Hill  
FROM: Bill Wailer  
SUBJECT: Fish Kill on Dolores River - Sunday, August 11, 1974

Bill Fischer reported a fish kill on the Dolores River to Lloyd Hazzard on August 11. Fred Hinman and I investigated the area on August 12.

Rico-Argentine is presently engaged in a silver recovery process at Rico, Colorado. The process consists of placing old mine dump material that has been crushed on an area that has been covered with butyl rubber. Slaked lime is mixed with the crushed material, 6 to 8 pounds per ton, and Cyanic acid is sprayed over the top of the mixture. The liquor is supposed to percolate down through the material, pick up the silver, hit the butyl rubber and flow down to concentration ponds where the silver is extracted.

The problem occurred some time prior to 8:00 A.M. on Sunday, August 11, 1974. According to the general manager of the mine, a blowout occurred on the stream side of the pile. Apparently the liquor had built up in one area of the pile and did not percolate through. Pressure increased and the liquid, approximately 3,000 to 5,000 gallons, blew out into the river. There was enough of a butyl safety margin to catch the mud, but the liquid went into the river in one slug. This was a freak accident and had it occurred 50 feet to either side of where it did, the entire spill would have been contained by mine ditches.

The liquid that hit the river contained a large amount of cyanide. Cyanide reacts rapidly with oxygen and will deplete an area of oxygen. This is what happened in the river. Most of the dead fish that were found had their mouths wide open and fishermen reported that fish were swimming with their heads out of the water. We estimate that fish and insects were suffocated for about 15 miles downstream of the Rico-Argentine operation. (Refer to enclosed map.) The toxicity diminished as the solution went downstream due to oxidation, agitation, and other inflow.

We did find live insects (caddis and mayflies) right below where the slug hit the river, but they were few and far between. We estimate that 90% of the insects were lost in the first four miles, 75% in the next four, 60% in the next four, and 30% in the last three. The fish kill estimate is 100% in the first four miles,

75% in the second four, 50% in the third four and 25% in the last three.

Following is a number estimate of fish killed. These numbers do not take into account the natural reproduction that has been lost because of the spawners that would have spawned.

Estimate of Potential Fish Population - 80 lbs/acre<sup>1)</sup>  
Natural Game Fish Population 20 lbs/acre (Brook, Brown, Native)  
Planted Game Fish Population 30 lbs/acre (Rainbow)  
Natural Forage Fish Population 15 lbs/acre (Sculpin, Dace)  
Natural Rough Fish Population 15 lbs/acre (Suckers)

Estimate of Potential Fish Population Numbers  
Natural Game Fish - 80 /acre (Brook, Brown, Native)  
Planted Game Fish - 120/acre (Rainbow)  
Natural Forage Fish - 450/acre (Sculpin, Dace)  
Natural Rough Fish - 45/acre (Suckers)

Estimate of Stream Acreage  
Section 1 4 miles, 35 ft. wide average = 16.97 acres  
Section 2 4 miles, 35 ft wide average = 16.97 acres  
Section 3 4 miles, 45 ft wide average = 21.82 acres  
Section 4 3 miles, 50 ft wide average = 18.18 acres  
Total Estimated Acreage 73.94 acres

Estimate of Fish Killed - Section 1 - 100% Kill  
Natural Game Fish 1,357  
Planted Game Fish 2,036  
Natural Forage Fish 7,636  
Natural Rough Fish 763

Estimate of Fish Killed - Section 2 - 75% Kill  
Natural Game Fish 1,017  
Planted Game Fish 1,527  
Natural Forage Fish 5,727  
Natural Rough Fish 572

Estimate of Fish Killed - Section 3 - 50% Kill  
Natural Game Fish 872  
Planted Game Fish 1,309  
Natural Forage Fish 4,909  
Natural Rough Fish 490

Estimate of Fish Killed - Section 4 - 25% Kill  
Natural Game Fish 363  
Planted Game Fish 545  
Natural Forage Fish 2,045  
Natural Rough Fish 204

1) Fishery Management Bulletin No. 36, Fish Population Estimates and Related Data From Small Trout Streams, W. D. Klein, 1964.

Estimate of Total Fish Killed

Natural Game Fish 3,609 - 902 lbs.  
Planted Game Fish 5,417 - 1,354 lbs.  
Natural Forage Fish 20,317 - 45 lbs.  
Natural Rough Fish 2,029 - 676 lbs.

Dollar Value for Fish Killed

- 2) Natural Game Fish - (Brook, Brown, Native) 60¢ @ \$1082.70 (8" avg.)
- 2) Planted Game Fish - (Rainbow) (48¢ @) \$2600.16 (10" avg.)
- 3) Natural Forage Fish - (Sculpin, Dace) (3¢ @) \$609.51 (all sizes)
- 3) Natural Rough Fish - (Suckers) (14¢ @) \$284.06 (all sizes)

Total Dollar Value \$4,576.43

I believe that the figures are as accurate as could be obtained. The problem will probably not occur again since the general manager had equipment and men working to repair the situation. If Rico-Argentine could replace the game fish or reimburse the Division for fish replacement, the problem would be resolved.

WCMW:rt

*Bill*

cc: Lloyd Hazzard  
R. F. McDonald  
Bill Fischer  
Pete Barrows  
Gerald Wischmeyer  
T. Lynch  
Wayne Seaman  
Don Horak  
John Goettl  
Fred Matter  
Fred Hinman  
Rico-Argentine General Manager - O. Jahnke

- 2) Four Seasons Trout Farm price list
- 3) Monetary Values for Fish, American Fisheries Society

